REMARKS

Claims 23-34, 38-50 and 52-55 are pending. Applicants thank the Examiner for confirming the amendments submitted on January 3, 2006 did not add new matter.

Claims 23 and 38 were amended to recite a Cu lower limit of 4.3% as supported by claim 39. Claim 39 was amended to recite a Cu lower limit of 4.4% as supported by page 7, first paragraph.

New Claim 54 is supported by an example at page 9. Claim 55 is supported by Claim 23 and the examples at page 9 which show 0% Zr. The range $0 < Fe \leq 0.10$ is supported by the Claim 23 recitation of Fe: ≤ 0.10 and "comprises Fe".

I. Claim Objections

Claims 23-34, 38-50, 52 and 52 stand objected to for informal matters. The Office Action asserts the language "substantially Mn-free is unclear." In response, claim 23 has been amended to recite "essentially free of Mn." This language has been held by the Federal Circuit to mean that Mn can be present as an "unavoidable impurity." *In re Marosi*, 710 F.2d 799, 802 (Fed. Cir. 1983). It is respectfully submitted this is narrower than the <0.1 range mentioned in the present application and less than the 0.09% lower limit which the Office action asserts is taught by US 6,562,154 to Rioja et al.

Reconsideration is respectfully requested.

II. 35 USC § 103

A. Rioja et al.

Claims 23-30, 32-34, 38, 40-50, 52 and 53 stand rejected under 35 USC § 103(a) as allegedly being unpatentable over Rioja et al. (U.S. Patent No. 6,563,154). The Office Action asserts Rioja et al. teaches an alloy having elemental percentages which overlap the percentages recited by the present claims, as well as the presently recited process steps.

Claim 23 has been amended to recite a lower limit for Cu of 4.3% by weight from non-rejected Claim 39. Thus, it is respectfully submitted this rejection is overcome.

B. Rioja et al. in view of Metals Handbook

Claim 31 stands rejected under 35 USC § 103(a) as allegedly being unpatentable over Rioja et al. in view of "Metals Handbook Desk Edition" pg. 445-446 (Metals Handbook). The

Office Action asserts Rioja et al. teaches each feature of this claim, except for rolling the alloy into thick sheets, for which purpose Metals Handbook is cited. However, it is respectfully submitted the secondary reference fails to cure the above discussed deficiencies of Rioja et al.

C. Rioja et al. in view of Dif et al.

Claim 39 stands rejected under 35 USC § 103(a) as allegedly being unpatentable over Rioja et al. in view of Dif et al. (U.S. Published Patent Application No. 2004/0079455). It is assumed this rejection now applies against amended Claim 1.

The Office Action asserts Rioja et al. teaches each feature of the claim, except for a method of casting, heat treating, and working an aluminium alloy with 4.3-4.5% Cu, for which purpose Dif et al. is cited. The Office action asserts Dif et al. teaches its Al-Cu-Mg alloys with substantially no Mn and 3.6-4.5% Cu exhibit a good compromise between strength and toughness. A comparison of elemental ranges is given by the following table.

	Present Claim 23	**Rioja et al. Alloy I**	**Rioja et al. Alloy II**	**Rioja et al. Alloy III**	**Rioja et al. Alloy IV**	**Dif [0007]**
Cu	4.3 - 4.9	3.5 - 4.5	3.8 - 4.4	3.4 - 4.0	3.2 - 3.8	3.6-4.5
Mg	1.0 - 1.8	0.6 - 1.6	1.0 - 1.6	1.0 - 1.6	1.0 - 1.6	1-1.6
Mn	Essentiall y free	0.3 - 0.7	0.3 - 0.7	0 - 0.4	0.3 - 0.7	<0.05
Si	0.10 - 0.40					up to 0.09
Zr	≤ 0.15	0.08 - 0.13	0.09 - 0.12	0.09 - 0.12	0.09 - 0.12	0.08-0.20
Li					≤ 0.75	
Cr	≤ 0.15	-	-	-	-	
Fe	≤ 0.10	-	-	-	-	up to 0.08
Zn, Ag. Li, Si		≤ 1	≤ 1	≤ 1	≤ 1	
Hf, Sc, Zr, Li		≤ 1	≤ 1	≤ 1	≤ 1	
Cr, V, Mn, Ni, Fe		≤ 1	≤ 1	≤ 1	≤ 1	

Dif et al. specifies less than 0.09% Si. Dif et al. discloses an alloy with 3.6 - 4.5 Cu, 1.0 - 1.6 Mg, 0.08 - 0.20 Zr, up to 0.06 Sc, up to 0.08 Fe, up to 0.09 Si and < 0.05 Mn. The preferred embodiments according to [0046] contain no Si at all and in all examples the Si content is <

0.06. Thus, it is respectfully submitted there is no motivation to pick and choose only the Mn and Cu ranges of Dif et al. and combine them with the other ranges of Rioja et al. and then go the further step of selecting only an upper portion of the broad range of Rioja et al. to arrive at the presently claimed composition.

It is respectfully submitted if Dif et al. and Rioja et al. were combined one skilled in the art would at best have an alloy with less than or equal to 0.09% Si. In contrast, the alloy of the present claim 23 is not only essentially Mn-free, but additionally contains 0.10 - 0.40 % Si, see [0070], [0071] and [0072].

Moreover, the July 9, 2003 filing date of Dif et al. is after the August 20, 2002 priority date of the present application. It is respectfully submitted present claim 23 is entitled to the priority date of its priority document EP 02078444.3 as shown in the following Table.

Present Claim 23	**Support in EP 02078444.3 (Priority Document)**
A method of producing a balanced Al-Cu-Mg-Si alloy having a high toughness, good strength levels and an improved fatigue crack growth resistance, comprising the steps of:	Claim 7
a) casting an ingot comprising the following composition (in weight percent): Cu: [[3.6]] 4.3 - 4.9 Mg: 1.0 - 1.8 Si: 0.10 - 0.40 Zr: ≤ 0.15 Cr: ≤ 0.15 Fe: ≤ 0.10, the balance essentially aluminum and incidental elements and impurities,	Claim 7, with Cu lower limit of page 7, line 13, and
wherein the alloy product is essentially free of Mn ~~substantially Mn-free~~ and comprises Fe,	Mn range of page 7, line 10 "incidental elements and impurities"
wherein the ingot is cast by semi-continuous direct chill (DC) casting,	Claim 7
b) homogenizing and/or pre-heating the ingot after the casting step,	Claim 7
c) hot rolling the homogenized and/or pre-heated ingot and optionally cold rolling into a rolled product,	Claim 7
d) solution heat treating the hot rolled product,	Claim 7
e) quenching the solution heat treated product,	Claim 7
f) stretching the quenched product, and	Claim 7
g) naturally ageing the stretched, rolled and heat-treated product.	Claim 7

Thus, Dif et al. is not prior art to present Claim 23.

Dif et al. claims priority to provisional application no. 60/394,234 (the '234 application) filed July 9, 2002. The ‘234 application discloses an alloy including 3.6-4.5% Cu (paragraph bridging pages 3 and 4). However, Paragraph [0008] of Dif et al., relied upon in the Office action for discussing a compromise between fracture toughness and mechanical strength, is not in the ‘234 application.

Thus, Applicants respectfully submit Claim 39 is allowable over the combination of Rioja et al. and Dif et al.

Moreover, Applicants respectfully submit the present Claim 23 selection of 0.10-0.40% Si is a selection invention.

Rioja et al. concerns aluminium sheet products having improved FCGR. Suitable alloys for these products belong to the AA 2xxx, 5xxx, 6xxx and 7xxx series for which different example alloy ranges are given. Rioja et al. discloses four specific Al-Cu alloy embodiments, as listed in the above table. These four alloys may comprise up to 1% of at least one additional alloying element selected from Zn, Ag, Li and Si and may further comprise up to 1% of at least one additional alloying element selected from Hf, Sc, Zr, Li and up to 1% of at least one additional alloying element selected from Cr, V, Mn, Ni, Fe. However, Rioja et al. does not select alloys which are essentially Mn-free and contain Si above the usual maximum level for aerospace applications of 0.10 % and more in particular of 0.07 %.

The examples given in Tables 1 and 2 of Rioja et al. imply Si is kept at impurity level in all samples. Table 1 also implies that, from the first group of optional alloying elements, only Li is added in considerable amounts. Moreover, for each of the alloy samples a specification is given for what kind of alloy it is. For example, a "Zr alloy" (i.e., Alloy 770-308), a "Zr+Li alloy," a "Mn+Zr alloy," a "Zr+Sc alloy," a "Zr+Sc+Li alloy" and a "Mn+Zr+Li alloy." There is no example of a "Si alloy" according to the nomenclature used by Rioja et al. Thus, Rioja et al. does not disclose or suggest to select an alloy essentially Mn-free with a Si content of 0.1 - 0.4%.

The examples 770-308 and 770-310 of Table 1 (col. 7) of Rioja et al. are close with 0% Mn (both alloys) and 0.04% Si (308 alloy) and 0.03% Si (310 alloy). However, these Si levels are below the range recited by the present claims, i.e., 0.10 - 0.40%.

In the discussion of the test results, column 9, lines 6-23, Rioja et al. states that Zr and/or Sc are beneficial as dispersoid forming additions, Li additions aid in the attainment of unrecrystallized microstructure, Cu and Mn have a substantial effect on strength properties and Li exhibits larger improvements in properties as a result of the cold deformation than alloys without the Li addition.

Although Si is discussed at Rioja et al., col. 5, ln. 46-47 and 54-55, Si is only used in

combination with alloys well outside the ranges recited by present claims. Specifically, the reference at col. 5, ln. 46-47 and 54-55, teaches to use "0 to about 0.5 weight percent Si" in combination with 0 to about 1.5% Cu, or "about 0.1 to about 2.5 Si" in combination with 0 to about 2% Cu (col. 5, ln. 46 and 55-56).

Also, Rioja et al., col. 10, lines 3-7, states high Mn variants exhibited higher strengths than the lower Mn variants and the strengthening effect of Mn was surprisingly higher than that of Cu. This is repeated in column 10, lines 14-18. This teaches to use an Al-Cu alloy with high Mn and an addition of Li, and teaches away from an Al-Cu alloy essentially free of Mn which uses Si to improve strength levels.

D. Dependent Claims

Claims 42-44 recite higher levels of Si than their base claim to further distinguish over the cited references.

New Claim 54 further distinguishes over the cited references. This claim recites a lower limit of Mg of 1.68% as supported Table 1 at page 9 of the present specification. Rioja et al. and Dif et al neither teach nor suggest such a Mg percentage range. Thus, Applicants respectfully submit this claim further distinguish over the cited references.

Also, Dif et al. replaces Mn with Zirconium or Zirconium plus Scandium. In contrast, Claim 55 lacks added zirconium and/or scandium. Thus, the motivation to omit Mn of Dif et al. is irrelevant to Claim 55 so there is no reason to combine the references to arrive at the invention of this claim.

III. Conclusion

In view of the above, it is respectfully submitted that all objections and rejections are overcome. Thus, a Notice of Allowance is respectfully requested.

Respectfully submitted,

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